STATEMENT OF BASIS/FINAL DECISION AND RESPONSE TO COMMENTS SUMMARY

REGION V
ID# 1394

Purdue University
West Lafayette, Indiana
(Signed 4 May 1995)

Facility/Unit Type:	***Closed, solid waste landfills at university research farms***
Contaminants:	**Carbon disulfide**
Media:	***Groundwater***
Remedy:	**Augmentation and maintenance of landfill cover, monitoring of groundwater and *stream water.***

FACILITY DESCRIPTION

Under federal RCRA permit conditions, Purdue University conducted a RCRA Facility Investigation (RFI) of two of its landfills, which was approved by EPA on February 8, 1991. Purdue also conducted a corrective measures study (CMS) at the direction of EPA, which was approved on September 30, 1994. In compliance with 40 CFR §§270.41 and 270.42, EPA is proposing a Class 3 (major) modification to Purdue's Federal RCRA permit to formalize the selected corrective measures.

Purdue University is a State-supported research and teaching institution. The campus covers 13 square miles in the town of West Lafayette, Indiana. The University owns and operates two research facilities, known as the Thomas Farm and the Horticulture Farm. Each farm contains a closed solid waste landfill for which corrective action has been required. The landfills have received incidental disposal of a variety of wastes over several years by many University departments and maintenance personnel.

The Thomas Farm Dump is a closed landfill with a clay/vegetated cap. It covers approximately 209,100 square feet and contains an estimated 87,900 cubic yards. Contents of the landfill include branches, brush, stumps, construction debris, tires, domestic trash, fly ash, discarded vehicles, implements, appliances, waste NACl road salt, and laboratory wastes (bottles and jars of acids, bases, ethers, peroxides, spent solvents, reactive metals). The following chemicals were detected in soil and stream sediment samples at the foot of the landfill: 23-100 ppb acetone, 7 ppb benzene, 920-1900 ppb semivolatiles (acenaphthene, anthracene, chrysene). Isolated hits in groundwater showed 11 ppb carbon disulfide (down gradient) and 11 ppb dichloromethane (down gradient). Leachate which had elevated pH and chloride ion content had been infiltrating into the adjacent stream, prior to the application of rip-rap and additional clay clap on the flank of the landfill.

The Horticultural Farm Dump is a closed landfill with a clay/vegetated cap that covers approximately 65,000 square feet. The contents of this landfill includes trash, construction debris, spoiled produce, and discarded jars and bottles from laboratories. Isolated hits of contaminants in groundwater showed the following: 26 ppb acetone (up gradient), 7 ppb bromoform (up gradient), 11 ppb dichloromethane (up gradient), 14 ppb dichloromethane (down gradient), 11 ppb dichloromethane (up gradient) and 6 ppb dichloromethane (up gradient).

The surrounding land use is primarily agricultural and residential. Approximately 600 people live within a 2.5 mile radius of the landfill areas. The Purdue University drinking water well field is located 1.25 miles from the landfill areas. The landfills are filled gullies on the flanks of a creek which is a tributary of the Wabash River. The landfills are located on the glacial till plain above the Wabash River aquifer. The glacial till is

predominantly a gravely clay, with discontinuous sand lenses. The aquifers of concern in the landfill areas are within the sand lenses. Local ground water flow approximately mirrors the local topography. The Wabash River aquifer does not appear to be impacted the landfills. The area is in a temperate climate with an average annual precipitation of 36.5 inches, average daily maximum temperatures of 30.6 degrees F in January and 84.3 degrees F in July.

EXPOSURE PATHWAYS

Groundwater passing beneath (down gradient of) the Thomas Farm Landfill was found to contain elevated concentrations of carbon disulfide. Investigation of the Horticultural Farm Landfill revealed no statistically significant difference in the down gradient versus up gradient groundwater. The potential exposure pathways for contaminated groundwater are dermal contact and ingestion.

SELECTED REMEDY

The selected remedies for remediation of the two landfills will prevent further infiltration of contaminants in to the groundwater. The estimated cost of the selected remedies is $600,000. Previous investigations included topographical, geophysical, and hydro geological studies that were performed by various students over several years, and the results were incorporated into the RFI. Specific components of the remedy for the Horticultural Farm Landfill include:

- Permanent access restriction;
- Application of rip-rap to the western slope, where needed;
- Regrading and compaction of the landfill cover, where needed; and
- On-going monitoring of groundwater and stream water for volatile organic compounds (VOCs).

Specific components of the remedy for the Thomas Farm Landfill include:

- Augmentation of landfill cover with clay, top soil and vegetation; and
- On-going monitoring of groundwater and stream water for VOCs.

INNOVATIVE TECHNOLOGIES CONSIDERED

None.

CONTAMINATION DETECTED AND CLEANUP GOALS

Media	Estimated Volume	Contaminant	Maximum Concentration (ppb)	Action Level	Cleanup Goal	Point of Compliance
Groundwater	Not given	Carbon disulfide	11	Not given	Continue detection monitoring program	Intersections of landfill boundaries with upper-most aquifers

PUBLIC PARTICIPATION

A public notice was published on January 30, 1995 and also broadcast on local AM and FM radio stations. The public comment period began on January 31, 1995 and ended on March 20, 1995. A public hearing was not requested. One set of comments was received which resulted in minor changes to the permit modification.

NEXT STEPS

Implementation of selected remedies.

KEYWORDS:
groundwater; Ingestion, Dermal contact; VOCs, Carbon disulfide; Capping; Groundwater monitoring

CONTACT:
Don Heller
U.S. EPA, Region 5
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 353-1248